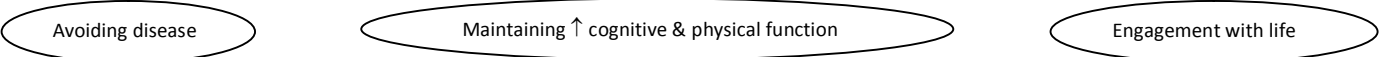


- Is the branch of medicine that focuses on health care of the elderly. It aims to promote health, to prevent & treat diseases & disabilities in older adults.
- Older adults are challenging clients because they present a complex clinical picture, a composite of the interactions between ⊥ aging changes, chronic illness, functional change, & at times acute illness.

– WHO IS THE ELDERLY ? & WHY GERIATRIC MEDICINE ?

- An Aging Population: - One of the main features of the Egyptian population over the last few decades is the gradual increase in the absolute & relative numbers of older people; the percent of older people (defined as 60 years of age or more) was 6.27 % of the total population (about 5 millions) according to (CAPMAS, 2006). The expected percentage of older people may reach 8.9% in 2016 and 10.0%, in, 2026.
- Accordingly, the expected rate of increase in total population from 1996 to 2026 is about 57%, while the expected rate of increase among older people during the same period is about 79% (Gad Allah, 2004).
- The elderly is different:
 - ~ **Physiological Changes** in the Elderly (Normal Aging ≠ Pathologic Aging)
 - ~ **Systemic Conditions at Higher Risk** in an Older Population e.g. dementia, Parkinsonism, stroke, heart diseases
 - ~ **Overlapping Variables** (physiological, , social, psychological, environmental variables & multiple diseases), heterogeneous Population, Need for Individualized TTT
 - ~ **Atypical presentations of diseases** e.g. delirium, fatigue, falls, cognitive impairment.
 - ~ **Poly-pharmacy**
 - ~ **Multidimensional, Interdisciplinary, Geriatric team**
- Different assessment approach : the goal is function & Quality of life (**to add life to years NOT years to life**)



Ageing: A process of gradual & spontaneous change, resulting in maturation through childhood, puberty, & young adulthood & then decline through middle & late age.

Senescence: الشيخوخة Process by which capacity for cell division, growth, & function is lost over time, ultimately leading to an incompatibility with life; i.e., the process of senescence terminates in death.

1- Physiology of Normal aging: The normal aging process involves gradual decrease in organ system capabilities homeostatic controls that are relatively benign in the absence of disease, the steady decreases of physiologic reserves make older adults potentially vulnerable to functional decline from acute & chronic illness.

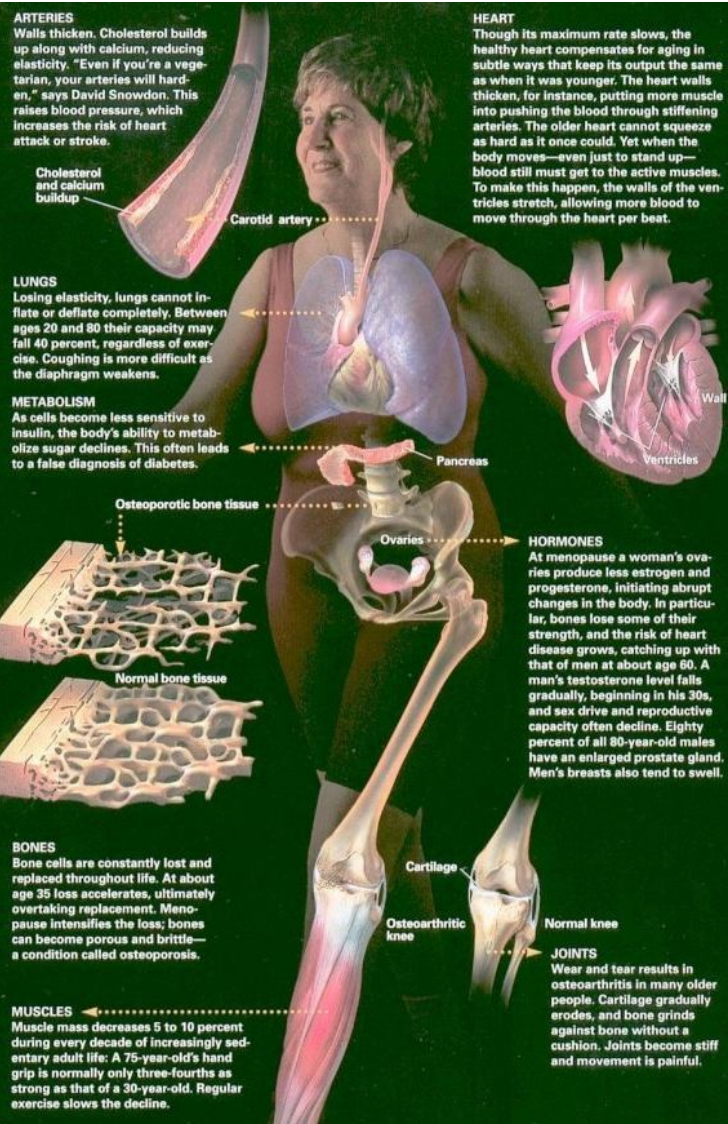
Generally, elderly person is: **Stiffer** / **Slower** / **Stresses** less adaptive

2- Physiological effects of aging → AGEING IS NOT A DISEASE. AGEING IS A DEVELOPMENTAL PROCESS

- a- **General changes:** - ↓ Bone mass / Lean mass (Sarcopenia) / Water content / BMR
- ↑ Total body fat (Visceral fat)

b- **Specific changes:**

1. Diffuse hair loss.
2. Reduced smell.
3. Presbyopia, lens opacity.
4. Cervical spondylosis.
5. Loss of lung compliance.
6. Reduced GFR & tubular function.
7. Loss of skin elasticity.
8. Osteoporosis.
9. Osteoarthritis.
10. Reduced neurone capacity.
11. Reduced taste.
12. Dilatation of aorta.
13. Reduced Stroke volume.
14. Systolic H, postural H.
15. Impaired glucose tolerance.
16. Constipation.
17. Muscle wasting.
18. Reduced number of sweat gland.
19. Reduced position sense.
20. Reduced hearing.



3- Disorders presenting with atypical features (e.g. confusion) in elderly Pts.

- M. Infarction or P. Embolism → confusion, blackout / dyspnea / palpitation without chest pain.
- Pneumonia → confusion with no fever.
- Peptic ulcer → anemia, GIT bleeding, without dyspepsia.
- UTI → confusion & urinary incontinence.
- Hyperthyroidism → apathy, weight loss, cardiac signs without anxiety.
- Hypothyroidism → lethargy.
- D.M. → asymptomatic until complications e.g. diabetic triopathy.
- Brain tumor → confusion without headache.

4- Atypical presentation of the ds in elderly:

- Disease presentation is either:
- **Symptomatic:** patient is complaining → 1- Typical: with the usual symptoms described
2- Atypical: when ds presents with symptoms that are not typically seen in the disease "e.g. painless M. Infarction"
 - **Asymptomatic:** patient is not complaining at all.

N.B. - elderly people are more likely to present with atypical symptoms; this is because of: 1- Age-related changes of the different systems
2- Presence of multiple co-morbid conditions
3- Poly-pharmacy

- Significance of the "Atypical Presentation"

- Presence associated with delay in diagnosis & increased mortality
- May also cause misdiagnosis & mismanagement
- Predictive of future functional declines in community elderly
- Functional decline increases likelihood of further decline & increased mortality

- Clinician's general approach to the "Atypical Presentation"

- Consider recent change in function a result of disease or drugs until proven otherwise
- Longitudinal multiple assessments often necessary
- Additional informants often invaluable
- Appropriate screening investigations have a role
- Multiple pathologies are the rule

- Common Atypical Presentations

- Functional decline (Dwindles = تضاؤل)
- Weakness
- Falls
- Immobility
- Incontinence
- Delirium
- Mood Change
- Social crisis

- Examples of atypical presentation of disease: a- Atypical presentation of CHF → - no significant tachycardia

- Exertional symptoms are late
- Symptoms of hypo perfusion are common

b- Atypical presentation of IHD →

- o Epigastric pain
- o Attacks of dyspnea
- o Attacks of back P3:in
- o Attacks of jaw pain
- o Attacks of neck pain
- o Attacks of right shoulder pain

c- Atypical presentation of hyperthyroidism →

- o Tremors: usually not present but if present coarse
- o Skin: no change
- o Perspiration: no change
- o Tachycardia: not significant or absent
- o Eyes: occasional ophthalmopathy usually no change
- o Bowels: no change, occasionally the 'joyful" relief from constipation.

5- GIANTS OF GERIATRIC MEDICINE

A- DELIRIUM هذيان (ACUTE CONFUSIONAL STATE)

- 1- Def.: Rapidly developing fluctuating behavior change characterized by inattention, altered arousal, incoherent speech/thought/action, global memory & intellectual impairment, emotional liability, illusions & hallucinations.
- 2- Prevalence: - Delirium affects 30% of medical & surgical ward elderly & 9 - 16% of those living in nursing homes
- 14% mortality rate within 1 month from delirium & 22% mortality rate within 6 months from delirium.
- 3- DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision) diagnostic criteria for delirium:
- A. Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) with reduced ability to focus, sustain or shift attention.
 - B. A change in cognition or the development of a perceptual disturbance that is not better accounted for by a preexisting, established or evolving dementia.
 - C. The disturbance develops over a short period of time (usually hours to days) & tends to fluctuate during the course of the day
 - D. There is evidence from the history, physical examination or laboratory findings that the disturbance is caused by the direct physiological consequences of a general medical condition.

- 4- The central features of the diagnosis are:
- 1- Acute onset with fluctuating course
 - 2- Disorganized thinking
 - 3- Alteration in the level of consciousness
 - 4- Inattention

- 5- Risk factors of delirium:
- 1. Increased age
 - 2. Dementia
 - 3. Sensory impairment (e.g.: hearing impairment - visual impairment)
 - 4. Multiple co-morbidities

- 6- Causes of delirium: "DELIRIUM" → D = Drugs (use new drug, or ↑ the dose)
- E = Electrolytes & physiological causes (e.g.: ↓ Na, hypoxia)
- L = Lack of drug (withdrawal)
- I = Infection (e.g.: chest infection, urinary infection)
- R = Reduced sensations (e.g.: deafness, blindness)
- I = Intra-cranial problem (e.g.: stoke, trauma, infection, epilepsy, .etc)
- U = Urinary retention - Fecal impaction
- M = Myocardial causes.,(e.g.: M. Infarction, arrhythmia, heart failure)
- Metabolic & Endocrinal: hypoglycemia, hyperglycemia, hypothyroidism, hyperthyroidism.

- 7- Clinical picture: acute onset with fluctuation of:
- 1- Disorders of attention (N.B.: Attention = ability to maintain focus & selectively shift mental activities)
 - 2- Arousal:
 - Increased, irritability & excitability
 - Decreased, cloudiness of consciousness & decreased response to stimuli
 - 3- Cognitive impairment:
 - Disorientation
 - Poor memory, short & long term
 - Incoherent thinking! / speak
 - 4-Neuro-psychiatric findings:
 - Hallucinations
 - Illusions
 - Delusions
 - Emotional distress

- 8- Types (classification) of delirium:
- 1. Hyper-active delirium: Characterized by increased psychomotor activity & agitation.
 - 2. Hypo-active delirium: Characterized by decreased psychomotor activity. It resembles depression.
 - 3. Mixed delirium: Has both hypoactive & hyperactive features.

- 9- Diagnosis of Delirium:
- 1- MMSE (Mini-Mental State Examination)
 - 2- CAM (Confusion Assessment Method):
 - 1- Acute onset and fluctuating course
 - 2- Inattention
 - 3- Disorganized thinking
 - 4- Altered level of consciousness
- Diagnosis of delirium requires presence of 1 + 2 & either 3 or 4

- N.B.: a- Identify the cause:
- 1- History & examination (including full neurological examination)
 - 2- Review of drugs
 - 3- Laboratory & imaging studies (guided by history) e.g.: electrolytes - blood sugar - CBC - urine analysis - CT brain etc
- b- Differential diagnosis of delirium: (1) Dementia (2) Depression (3) Anxiety

	1- Delirium هذيان	2- Dementia عته / خيل
Onset	Acute	Insidious
Duration	Hours / days / weeks	Months / years
Course	Fluctuates	Stable & progressive
Alertness	Fluctuates	⊥
Orientation	Always impaired	May be ⊥
Thoughts	Often paranoid & grandiose	Slowed / reduced interests
Perception	Visual & auditory hallucination common	⊥ / hallucinations in 30 – 40 % (often visual)
Emotions	Irritable – Aggressive - Fearful	Shallow – Apathetic – Labile – Irritable
Sleep	Nocturnal confusion	Often disturbed – Nocturnal wandering common

- c- Complications of delirium:
- 1. Iatrogenic complications (e.g. drugs, mechanical constraints)
 - 2. Incontinence
 - 3. Complications of bed ridden (e.g. pressure ulcers, aspiration)
 - 4. Malnutrition
 - 5. Hospitalization
 - 6. In general, there is an increased mortality in hospitalized patients who had delirium.

- d- Management of delirium:
- 1. Identify & remove or treat underlying cause
 - 2. Identify & modulate risk factors
 - 3. Provide general supportive measures:
 - Keep patient in quiet, well-lit room (e.g., night lights)
 - Ensure safe environment and strict supervision
 - Encourage familiar faces (family members) at bedside for reassurance
 - Provide orientation (e.g., calendar, clock)
 - Correct sensory impairment (e.g., vision, hearing)
 - Enhance mobility & range of motion
 - Care of bowel & bladder
 - Control of disruptive behaviors:

- Mild confusion & agitation may respond to interpersonal & environmental manipulation, frequent reassurance, touch & verbal orientation from familiar person.
- For acute agitation or aggression: use a high-potency anti-psychotic such as haloperidol.
- Use physical restraints only as last resort to maintain patient safety (e.g. prevent patient from pulling out tubes, catheters.

B- DEMENTIA عته / خيل

- 1- Def.: - an acquired \$ of mental impairment, cognitive & emotional impairment severe enough to interfere with daily functional quality of life & not resulting from impairment of level of consciousness' arousal' .
- Dementia differs from age-related memory loss, which is much milder, is not substantially progressive, & does not significantly impair function.
- 2- Prevalence of dementia:
- The prevalence of dementia doubles every 5 yr after age 60 until about age 90.
 - Dementia affects only 1% of people aged 60 to 64 but 30 to 50% of those > 85.
 - Dementia is the leading cause of institutionalization among the elderly; prevalence among elderly nursing home residents is estimated to be 60 to 80%.
- 3- Classification of dementia syndromes:
- 1- Degenerative disorders → a- Cortical:
 - Alzheimer's disease
 - Focal cortical degenerations e.g. fronto-temporal degenerations.b- Sub-cortical:
 - Parkinson 'disease.
 - Wilson's disease.c- Cortical & sub-cortical:
 - Lewy body dementia.
 - 2- Vascular dementias →
 - Multiple large vessel strokes.
 - Lacunar state (multiple subcortical infarctions).
 - Binswagner's disease (white matter ischemic injury).
 - Mixed cortical & subcortical strokes.
 - 3- Traumatic conditions →
 - Direct cerebral trauma.
 - Hematomas (subdural, intracranial).
 - 4- Neoplastic dementias → primary / metastatic.
 - 5- Inflammatory conditions → vasculitis / sarcoidosis.
 - 6- Toxic conditions →
 - Alcohol or drug abuse.
 - Metals (e.g. lead).
 - Industrial agents.
 - 7- Metabolic disorders →
 - Cardiopulmonary failure (hypoxia).
 - Uremia, dialysis dementia.
 - Hepatic encephalopathy.
 - Anemia & hematologic disorders.
 - Endocrine disorders (thyroid, adrenal, parathyroid).
 - Vitamin deficiencies (B12, folate, niacin).
 - 8- Infectious dementia →
 - Neuro-syphilis
 - AIDS.
 - Creutzfeldt-Jakob & other prion diseases.
 - 9- Normal-pressure hydrocephalus (This disorder causes up to 6% of dementia cases) →
 - 10- Depression

According to the previous causes, dementia could be classified also to reversible & irreversible or treatable & untreatable dementia.

Normal-pressure hydrocephalus

- 1- Def.: is a syndrome of gait disturbance, urinary incontinence & dementia in patients with enlarged brain ventricles & ⊥ or slightly ↑ CSF pressure.
- 2- Cause: It results from a defect in CSF resorption in arachnoid granulations.
- 3- Investigation: a- C.T
- b- Lumbar puncture with removal of 20 to 30 mL of CSF can be done as a diagnostic trial → Improvement in gait, continence, & cognition after such removal helps confirm the diagnosis & may predict the response to ventriculo-peritoneal shunting.
- 4- Treatment: Ventriculo-peritoneal shunting.

Diagnostic criteria (or dementia (DSMIV):

- 1- Development of multiple cognitive deficits manifested by both;-
- Memory impairment (impaired ability to learn new information or to recall previously learned information)
- +
- One or more of the following cognitive disturbances:
- Aphasia (language disturbance).
 - Apraxia (impaired ability to carry out motor activities despite intact motor function).
 - Agnosia (failure to recognize objects despite intact sensory function).
 - Disturbance in executive functioning (i.e. abstracting, planning, organizing, sequencing).
- 2- These cognitive deficits cause significant impairment in social or occupational functioning
- 3- Do not occur exclusively during delirium
- 4- Evidence by history, examination or investigations that the disturbance is the consequence of an organic etiology.

1- ALZHEIMER'S DISEASE (ACCOUNT FOR 50-60 % OF ALL DEMENTIAS)

- Pathogenesis:
- Acetylcholine is the main neurotransmitter that is deficient in AD patients.
 - Cerebral atrophy eventually occurs; however, atrophy is not strongly correlated with clinical severity.
- Risk factors:
1. Age: 65-85 years, risk doubles every 5 years.
 2. Sex: 2/3 of patients are ♀.
 3. Family history.
 4. Down's \$: all patients with Down's \$ > 35 years age have AD neuropathology.
 5. Head trauma.
 6. Education: low educational level is associated with increase risk.
 7. Depression.
 8. Environmental toxins: Aluminum.

The following stages characterizing the clinical picture of Alzheimer's disease:-

- 1- Mild Cognitive Impairment (preclinical):
- o No functional impairment.
 - o Report by patient or caregiver of memory loss.
 - o Objective signs of memory impairment.
 - o Some cases may not progress to AD.
- 2- Early, Mild Impairment (1-3 yr from onset of symptoms):
- o Disorientation for date.
 - o Naming difficulties (anomia).
 - o Recent recall problems.
 - o Mild difficulty copying figures.
 - o Social withdrawal.
 - o Irritability, mood change.
 - o Problems managing finances.
 - o Decreased insight.
- 3- Middle, Moderate Impairment (2-8 yr):
- o Disorientation to date and place.
 - o Comprehension difficulties (aphasia).
 - o Impaired new learning.
 - o Getting lost in familiar areas.
 - o Delusions, agitation, aggression.
 - o Not able to cook or do shopping.
 - o Restless, anxious, depressed.
 - o Problems with dressing and grooming.
 - o Impaired calculating skills.
- 4- Late, Severe Impairment (6-12 yr):
- o Remote memory loss.
 - o No longer grooming or dressing.
 - o Incontinent.
 - o Motor or verbal agitation.

There are also some non-cognitive symptoms may be associated with the previous symptoms as delusions (usually paranoid or persecutory), hallucinations (commonly visual), depressive symptoms & agitation or aggression.

2- VASCULAR DEMENTIA (2ND COMMON CAUSE OF DEMENTIA)

- Vascular dementia is more common among patients with hypertension or diabetes.
- Controlling risk factors for stroke is likely to slow progression of the dementia & improve function.
- Many patients with vascular damage also have concomitant manifestations of AD.

- C/P:
- The classic presentation is stepwise cognitive decline; each step is characterized by an ischemic insult & sometimes followed by modest cognitive recovery, However, in dementia caused by a lacunar state or ischemic injury largely limited to white matter, the steps may be so small that they are clinically indistinguishable from gradual decline.
 - The cognitive decline is associated with focal neurological signs & symptoms or radiological evidence indicative of cerebro-vascular diseases that are judged to be etiologically related to the disturbance.

3- DEMENTIA WITH LEWY BODIES

- It accounts for up to 25% of cases of dementia. Age at onset is typically >60 years.
 - It is characterized by microscopically identified Lewy bodies in the cerebral cortex & other areas of the brain which is rounded eosinophilic intra-cytoplasmic neuronal inclusions.
- C/P:
- Initial cognitive deterioration affects mainly visuo-spatial & Visuo-constructional function more than memory.
 - Impairment appears to result more from deficits in alertness and attention than from deficits in memory acquisition.
 - Patients may have well-defined visual hallucinations (often threatening).
 - Fluctuations in cognitive function.
 - Mild Parkinsonism.
 - Periods of being alert, coherent, & oriented may alternate with periods of being confused & unresponsive to questions, usually over a period of days to weeks but sometimes during the same interview
 - Paranoia & falls are common.
 - Delusions which are complex & bizarre compared with the simple persecutory ideation common in AD.
 - Autonomic dysfunction is common.
- Other causes of dementia account for the rest of cases & each type has its characteristic symptoms or signs in addition to the classical clinical picture of dementia.

- Evaluation:
- Clinical evaluation: Perform a comprehensive geriatric assessment.

- This includes:
1. History; obtained from family or other reliable informant.
 2. Physical & neurological examination.
 3. Mental status examination using MMSE = Brief assessment of orientation, word recall, attention, concentration, language & constructional praxis. Score is from 30 points. Used for screening for cognition impairment & detection of progression.
 4. Assessment for the presence of depression (GDS).
 5. Assessment of functional status (ADL, IADL).

- Investigations:
- 1- Laboratory testing; CBC, TSH, B12, serum calcium, liver & renal function tests, serologic test for syphilis.
 - 2- Neuro-imaging; Structural brain imaging using CT scan, MRI.
Functional brain imaging using PET, SPECT, show parietal & temporal deficit in AD.

- Treatment: Primary goals of treatment are to improve quality of life & maximize functional performance by enhancing cognition, mood, & behavior.
1. General treatment principles;
 - Identify & treat primary medical illness (e.g. hypertension in vascular dementia) .
 - Set realistic goals.
 - Limit psychotropic medication use.
 - Specify and quantify target behaviors.
 - Maximize and maintain functioning.
 2. Non pharmacologic approaches;
 - Behavioral techniques (e.g. distraction).
 - Environmental modification (e.g. adjusting stimulation level).
 - Family members to calm and reassure patient
 - Maintenance of daily routine.
 - Avoidance of residence changes.
 3. Pharmacologic treatment for AD;
 - Cholinesterase inhibitors, have beneficial effects on behavioral symptoms in some patients & can improve or stabilize cognition & slow decline in mild to moderate AD & may delay nursing home placement,
 - Memantine, Rivastigmine, Donepezil → acting on the glutamatergic system by blocking NMDA glutamate Rs.
 4. Pharmacologic treatment for vascular dementia;
 - Control risk factors e.g., smoking, DM, hyperlipidemia.
 - Stroke prevention, by using maintenance anti-platelet therapy.
 5. Pharmacological treatment for the non cognitive symptoms.

Care of AD patient & his family:

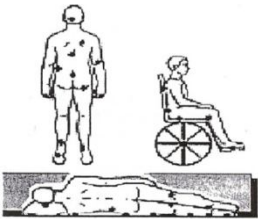
- In the early stages, the patient is still active, has insight & can use reminder techniques,
 1. Educate patient & family about symptoms & stages.
 2. Give cognition stimulation exercises.
 3. Medications should be monitored especially OTC
 4. Depression should be treated if overt.
 5. Driving is risky and should be stopped or evaluated by vehicles department.
- Behavioral management, educate the family to deal with different problem,
 1. Repetitive questions; distract the patient to other topic & do not discuss plans as patient will keep asking.
 2. Bathing; make it routine in the morning & use shower bench with hand shower .
 3. Dressing; offer simple choices.
 4. Sleep disturbance; provide stimulating activities during daytime.
- For caregiver stress and health, arrange for in-home help & day care facilities.
- Injury prevention orientation; through ensuring home safety & using additional locks for wandering safety.
- Late stages;
 1. Care of nutrition,
 2. Care of bed ridden,
 3. Consider the possibility of nursing home admission.

C- PRESSURE ULCERS

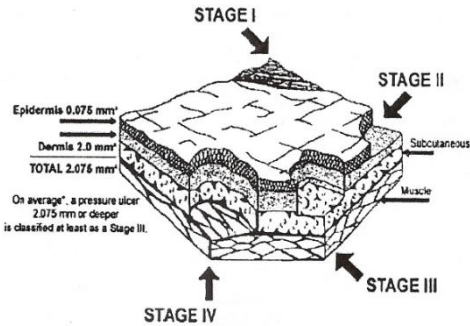
- 1- Definition: A localized area of soft-tissue injury resulting from compression between a hard prominence & an external surface. It a type of avascular necrosis
- 2- Clinical relevance:
- It is associated with significant morbidity & mortality, not because pathology itself, but rather because of patient's original bad medical condition.
 - Prevention is the most effective treatment.
 - Patients at risk of developing pressure ulcers can be identified by simple screening tools at primary care settings, as well as hospital.
 - Once ulcer reached advanced stages, treatment is very difficult or even practically not possible. While treatment of early stages is much easier & generally effective.
 - Detection of occurrence of early stages is possible by direct daily inspection of skin at high risk points. High risk sites are known (13 pressure points).

3- Clinical picture

- Stages** → 1- Stage I, non-blanchable erythema.
- 2- Stage2, partial thickness skin loss: is characterized by partial thickness skin loss, that is, the epidermis is interrupted as an abrasion, blister, or shallow crater.
- Similar to 2nd degree burns with blisters.
- 3- Stage 3, a full-thickness skin loss. SC tissue is exposed. Involves damage or necrosis of SC tissue that may extend to, but not through, the underlying fascia.
- 4- Stage 4, full-thickness skin loss. Ms or bones are exposed. Tissue necrosis or damage to Ms, bone, or supporting structures (e.g, a tendon or joint capsule).



- Sites:** 1. Common ANATOMICAL pressure points (13 in lower half of body).
2. Positional pressure points; by abnormal posture of the limbs or the body.
3. Instnumental pressure points; by orthotic devices and bed rails.
4. Any skin exposed to continuous pressure.
5. Internal viscera exposed to unusual pressure, as trachea pressed by balloon of endo-tracheal tube (esp. if a Ryle's tube is present), or severely distended colon in Ogilvie \$.
- Risk factors:** 1. Prolonged recumbence.
2. Warmth & moistures of skin; either soiled by urine & stool, sweating, wet sheets,- or even generalized or local edema.
3. Shear forces; during manipulation & positioning, e.g. rolling patient in bed ..
4. Bad general condition, or general illness, as pneumonia, electrolyte imbalance, malnutrition.
- Any patient with any of the above risk factors should be monitored for pressure ulcers.



- Dagnosis:** Screen for risk of ulcer development using Braden scale; Scores 15-18 indicate at risk, 13-14 indicate moderate risk, 10- 12 indicate high risk, 9 or less indicate very high risk. Frequent inspection of pressure points for early non-blanchable erytheama (stage 1).
- Differential diagnosis:** Should be differentiated from other lacerations, ulcers & eczymas; by site, sensation, surrounding inflammation, underlying pressure points, viability of the floor.
- Prevention & treatment:** 1- Decrease local pressure → • Reposition every 2 hours
- Use pillows to keep bony prominence away from direct contact
 - Use devices that relieve pressure on heels
 - Elevate the head of the bed as little as possible
 - Use lifting devices to move rather than drag the patient during transfer
 - Pressure reducing mattresses Skin care
 - Daily inspection for early detection of ulcer
 - Use moisturizers for dry skin e.g. commercial after-bath lotions
 - Avoid excess moisture in skin i.e. appropriate dryness Improve general health by adequate nutrition, hydration and control of medical illnesses
- 2- Treatment of pressure ulcer
- Stage 1: As prevention, more frequent turning
- Stage 2: As 1 + use of dressing to maintain wound damp and prevent dryness.
- Stage 3 & 4: as 1 + Debridement either chemical (small wound by saline dressing, or collagenase (Irxol ®) or surgical (large wound) dressing by ; wet to dry saline or hydrocolloid (duo-derm), or polyurethane deep wounds: fill the wound by aligniates (in exudative wounds) or hydrogel. May require myo-cutaneous flaps.
- Topical & systemic antibiotics should be used sparingly, as they have no role except in a few situations. Tincture benzoic should NOT be used in treatment of pressure ulcers at any stage except to protect the normal skin around it.

- Complications** occur particularly in long standing & neglected ulcers; a- Localized infection
- b- Osteomyelitis, or pyo-arthritis & carries a substantial mortality.
- c- Cellulitis in the pressure ulcer requires experience to diagnose & recognize due to the avascular nature of the ulcer, but it may be diagnosed by the new onset of pain in the previously painless ulcer, & the increased erythema around the wound.
- d- Generalized sepsis: Bacteremia and septicemia; Rare, particularly if neglected & long-standing.

D- URINARY INCONTINENCE (UI)

- 1- Def.:** Inability to withhold micturition that *CAUSES SOCIAL OR HEIGINIC PROBLEM*.
- It is a widespread problem (15-30% of community dwelling American elders & 50% of American nursing home residents) but yet potentially reversible. It can dramatically limit social interactions & causes infections, & increased falls risk.
- 2- Clinical picture:**
- 1- Reversible causes of UI** → From a geriatric point view, ANY case of UI in an elder, whether new or old, should be reviewed to search for items of reversible UI causes checklist; "**DIMAGERS**".
- The central clinical issue in management is to detect any possible common causers) of reversible incontinence to be treated etiologically.*
- Delirium /Dementia
 - Infections (UTI)
 - Atrophic vaginitis & urethritis.
 - Psychological causes (especially depression)
 - Pharmaceutical agents
 - Endocrine conditions (DM, DI, Hypercalcemia), or Excess urine output.
 - Restricted mobility
 - Stool impaction
- If none of the above conditions is present, then the condition is usually due to a practically irreversible cause, & managed symptomatically. Therefore, the symptoms of patients are classified into one of either 4 symptomatic categories, & treated symptomatically accordingly.

- 2- Irreversible cause of UI**
- 1- **Urge incontinence:** leakage of urine associated with a sudden, strong desire to void. This is often associated with UB over-activity, but urge is not specific for this condition. It's the only syndrome of irreversible incontinence with LARGE volume of escaped urine.
- 2- **Stress incontinence:** Leakage of urine with increases in intra-abdominal pressure from coughing, sneezing, laughing, straining, or exercising. It is associated with pelvic floor muscle laxity, neuropathy, & prior urologic surgery. Risk factors include multiple childbirth & traumatic deliveries.
- 3- **Outlet obstruction:** UI due to stenosis of UB neck, mostly by prostatic enlargement in men. Patients express hesitancy before micturition, precipitancy, & the stream is weak, interrupted & bifid, with sense of incomplete evacuation after leaving the bathroom. Few drops of urine escape after leaving bathroom following relaxation of the neck of UB, if UB de-compensation supervenes, overflow incontinence may ensue.
- N.B.:** Overflow incontinence: Leakage of urine associated with an overfilled UB. This has also been termed "paradoxical Incontinence," because symptoms of urgency & frequency occur despite the presence of a full bladder.
- 4- **Functional problems in elderly persons:** (e.g., environment, mentation, mobility, manual dexterity, medical factors, & motivation) are often superimposed on lower urinary tract dysfunction. These factors may contribute to established incontinence but rarely cause it.

- 3- Investigations:**
- a- Lab.: Urinalysis, Serum urea & Creatinine levels.
- b- Rad.: 1- Renal sonography: for men to measure post-void residual urine volumes to rule out hydronephrosis or other upper tract lesions. Routine in cases of hematuria (either microscopic or Gross), also IV urography or occasionally computed tomography or magnetic resonance imaging.
- 2- Cystogram: to rule out stones, tumors, diverticulae, or fistulae.
- c- Inst.: 1- Cystoscopy: For selected patients to detect tumors, diverticulae, & veSICOvaginal fistula
- 2- Voiding cystourethrogram: Is used to identify urinary reflux & to evaluate for urethral lesions.
- 3- Urodynamics: **a- Indications:** 1. For diagnosis of patient with complicated history
2. Patients for whom empiric therapy is unacceptable or has failed,
3. For whom surgical intervention is planned.

- 4- Treatment:** **A- BEHAVIORAL APPROACHES**
- Behavioral therapy is an effective tool in managing several types of incontinence it includes:
1. Voiding schedule or "Bladder training" to gradually increasing the intervals between voiding. For demented patients, prompted voiding decreases duration of wetting of patient, and cost of disposables.
 2. Pelvic floor muscle exercises. "Pelvic floor rehabilitation" also called Kegel maneuvers or Kegel exercises, refers to a regimen of exercises designed to strengthen the urethral sphincter and levator muscles of the pelvic floor
 3. Biofeedback: Combines Kegel maneuvers with computer or other technologies, which are used to translate physiological information into visual or audible signals.
 4. Supportive measures: catheters or diapers
 5. Other simple measures: Includes void drinking excessive fluids, & coffee at night.

B- MEDICATIONS

Drug therapy for geriatric incontinence includes (Anti-cholinergics, hormones, alpha-antagonists & cautious use of diuretics & ADH by an experienced physician.

- Indications for Urological Referral:**
1. Patients with high post-void residual volume (>200 cc),
 2. Severely limited bladder capacity (< 100 cc),
 3. Recent pelvic surgery or irradiation,
 4. Frequent urethritis, hematuria, & marked pelvic prolapse.
 5. In addition, men & women with stress urinary incontinence that is candidates for surgical correction should be referred; ,

E- OSTEOPOROSIS (SEE RHEUMATOLOGY)

The mainstay in pressure ulcer TTT is prevention of risk factors

No matter how expensive are the tools used without preventing risk factors, pressure ulcer will particularly never heal & usually will progress

F- FALLS IN ELDERLY

Falls occur in 30 – 40 % of the elderly & occur in 30 – 60 % of the institutionalized elderly

- 70% of all the deaths due to falls occur in those 65 years & over although they constitute 13 % of the population
- Fear of falling affects 25-40% of older adults, many of whom have not fallen& fear of falling is an independent risk factor for functional disability.
- Falls are more dangerous in elderly than any age group because of osteoporosis, limited social activities & slowed protective reflex.
- If an elderly Pt falls > 2 times in a six-month period, an evaluation for treatable causes should be taken
- The frequency of falling is related to the accumulated effect of multiple disorders superimposed on age-related changes.

RISK FACTORS & CAUSES OF FALLS:

- 1- Age related change:
 - o Stiffness.
 - o Less coordinated gaits .
 - o Decreased postural control & body-oriented reflex.
 - o Degeneration of large joint mechano-receptors altering proprioception .
 - o Memory impairment
 - o Vision & hearing impairment.
- 2- Environmental hazards (30-50%):
 - o Throw rugs.
 - o Poor lighting.
 - o Unsafe stairs.
 - o Objects on the floor.
 - o Slippery or uneven surfaces.
- 3- Gait problems resulting, from:
 - o Age related changes
 - o De-conditioning after period of immobility
 - o Stroke.
 - o Osteoarthritis.
 - o Myopathy.
 - o Poly-neuropathy.
 - o Fractures.
- 4- Dizziness
- 5- Vertigo
- 6- Drop attacks: Sudden fall associated with sudden leg weakness without dizziness or loss of consciousness due to transient Vertebro-basilar insufficiency.

N.B.: Leg weakness is usually transient but can persist for hours.
- 7- Cognitive impairment:
 - o Dementia can predispose to falling
 - o impairing judgment.
 - o Impairing, vlsuo-spatial perception.
 - o Decreased ability to orient oneself geographically.
 - o Wandering activities.
- 8- Ortho static hypotension: Present in 5% - 25% of normal elderly persons living at home.
- 9- Syncope
- 10- Diseases of central nervous system
- 11-Visual problems:
 - Age related changes.
 - Cataract.
 - Retinopathy.
- 12-Foot problems:
 - o Abnormally long toenails / Deformities / Improperly sized footwear.
- 13- Alcohol intake.
- 14- Drugs: causing impaired mentation, impaired stability or gait disorders e.g.: Anti-hypertensive / Anti-depressants.
- 15- Other causes: Seizures / Unstable joints / Anemia / Severe osteoporosis with spontaneous fracture.

DIAGNOSTIC APPROACH:

- At 1st we must stabilize & TTT any immediate problem bought on by the fall e.g. head injury or frctures
- A- History →
 - 1) History of risk factors & environmental risk.
 - 2) Pre-fall history: activities before falling, e.g. standing rapidly, palpitation.
 - 3) During the fall: fits, lose of conscious
 - 4) Post-fall history: Physical (fractures, contusion, wounds), psychic (phobia, anxiety, depression, fear)
- B- Examination →
 - 1- Full physical & neurological examination including assessment for postural hypotension, blood pressure & pulse should be measured after at least 5 mins
 - 2- Mental assessment.
 - 3- Fall screening examination using Time up & Go test

INTERVENTION & PREVENTION:

- Management needs inter-disciplinary team for comprehensive geriatric assessment: - Physicians / Nurses / Physio-therapist / Occupational therapist / Social workers / Dietitian & Pharmacist
- **Assessment of medications that may PPT falling**
- **Management of the etiology:** e.g.: - postural hypotension:
- Sleeping in bed with head raised.
 - Sitting on side of the bed & rising slowly
 - Wearing elastic stocking to decrease venous pooling in legs
 - ↑ Salt in diet
 - Pharmaco-therapy using low dose mineralo-corticoid (fludrocortisone)
- **Environmental modification:**
- Adequate lighting
 - Bathroom grabs bars
 - Raised toilet seats
 - Remove throw rugs
 - Avoid slippery floors
 - Bed at a comfortable & safe height
- **Assistive devices for patient with gait & balance disturbance e.g.** Walker, Crutches. Canes & shoes modification.
- **Fall prevention programs:** Even elderly who have not fallen can benefit; e.g.
- Standing & sitting down with different height chairs.
 - Standing & marching on a firm/foam surface. with eyes opened & closed.
 - Standing & kicking a ball at a target. ..
 - Walking on different surfaces under different lighting conditions

N.B.:

A- MINI-MENTAL STATUS EXAMINATION (MMSE) POSSIBLE SCORE IN DIFFERENT STAGES OF DEMENTIA:

1- Early (Mild impairment) score of 22-28

2- Middle (Moderate Impairment) score of 10-21 .

3- Late (Severe Impairment) Score of 0-9.

Higher MMSE cutoff 26 has a sensitivity of 91-100% in identifying persons who are incapable of providing consens

B- GERIATRIC DEPRESSION SCALE (GDS) The ⊥ score is 0-5, if more than 5 = depression.

C- TIME UP & GO TEST:

1- ⊥ < 10 sec.

2- Ab⊥ > 20 sec.

3- Between 10-20 sec, needs further investigations.

D- BMD: see rheumatology

E- EFFECTS OF AGING ON METABOLISM OF DRUGS

There is ↑ incidence of drug side effects, the risk can be minimized by starting off TTT with small doses & carefully monitoring the response. This is due to ↓ liver metabolism, ↓ renal excretion, ↓ lean body mass & ↑ body fat.

